of 3D brachytherapy to clinical practice. Trans-vaginal ultrasound of cervical cancer offers width, height and thickness of cervical tumour and makes HR CTV contouring on CT images easier.

PO-1026

A mixed intracavitary and interstitial perineal template compatible with MRI for gynecologic malignancies

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Purpose/Objective: To present the experience in the daily practice of a novel MRI compatible perineal template developed in our Department, able to support both: an intrauterine probe (SIU) (intracavitary component. IC) and titanium needles (TN. Interstitial component) for MRI-Guided brachytherapy (BT) applications, in gynecologic malignancies
There are different manufactured templates for interstitial implants as 'Martinez Universal Perineal Interstitial Template' (MUPIT) with angled openings or the 'Syed' template. Two deficits are inherent to the previously commented currently commercially available templates: the IC being difficult to reach cervix in depth and the necessity to use CT for the dosimetry being both not compatible with MRI.
Materials and Methods: The developed template, adapts the currently existing manufactured MR compatibles intrauterine tubes (Nucletron-Elekta) allowing the deliver a large central dose, and TN, also compatible with MRI, with the capacity to cover the disease in all directions in gynecologic malignancies. The template has been developed with the aid of Lorca Marín S.A, Murcia, Spain in the manufacturing process. In the MRI (General Electric 1,5 tesla) we use a T2 sequence for delineation of CTV and organ at risk following the recommendations of GEC-ESTRO and a 3D radio-frequency Spoiled Gradient recalled Echo (SPGR) sequence to recognized the applicator and TN (Figure). From April 2013 until November 2014, we have done sixteen implants. Fourteen patients were diagnosed of locally advanced cervix carcinoma (CC) and 2 vaginal recurrences of papilar serous endometrial carcinoma. Median age 66 years (33-77 years). Nine were staged as IIB (Figo 2009), 2, IIIB and II IV b.
Results: In the CC, BT have done after External beam radiotherapy (EBRT) over pelvis (median dose 50.4 Gy (48.6-53.7 Gy). All patients have received concomitant chemotherapy with EBRT. The dose administrated with BT have been 6 fractions of 4 Gy in four days in 14 patients, 6 fractions of 4.25 Gy in one patient because the delay between RTE and BT due to comorbidities. The dose has been prescribed to IR CTV in all cases following recommendations of GEC-ESTRO due to the charactheristics of the interstitial implant. Median D90 to IR-CTV calculated with EQD2 in patients with locally advance CC (we have excluded the 2 recurrences in vagina because they are different behavior disease) is 80,5 Gy (62-5-84,2) with a median D90 in organ at risk (OR): bladder of 77,4 Gy (60,5-90,8Gy) and 69,9 Gy in rectum (58,3-83,7 Gy). The median overall survival is 13 months (2- 19 months) with three patients with local persistence after BT. All doses in OR are under limits of GEC ESTRO recommendations.
Conclusions: This new template allows increasing the CTV of the BT procedures in locally advanced ginecological tumors in 4D MRI based BT, improving the possibilities for a more adaptative dosimetry with lower doses in OR.

PO-1027

Reducing vaginal wall dose for HDR interstitial brachytherapy of gynecological cancer: dosimetric comparison

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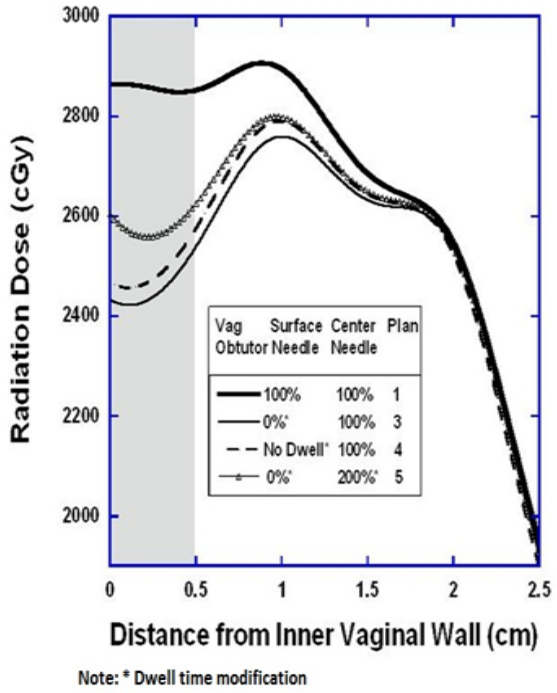
Purpose/Objective: Our previous interstitial brachtherapy (ISBT) experience was associated higher vaginal toxicities, especially for lower vaginal tumors, thus increasing our interest in minimizing vaginal wall dose. Previous guidelines for vaginal tolerance have been a point dose on the vagina wall from intracavitary brachytherapy. Advances in imaging and 3-D planning have allowed further investigation into volumetric dosimetry. The purpose of this study is to investigate whether altered dwell times for vaginal obturator needles can reduce the vaginal wall dose without compromising the target coverage.
Materials and Methods: To evaluate dosimetric changes on the vaginal wall dose, a vaginal cancer patient with ISBT was selected as a patient case. For comparisons, phantom case was set up which has parallel needle position as a perfect implant with same needle position as patient case. Vaginal wall was contoured as 0.5 cm thick volume around the vaginal surface of the obturator. Geometric optimization was used to create homogenous dose distribution on both phantom and patient cases as an initial treatment plan (20 Gy/4 fractions). To reduce high vaginal wall dose, five different plans was created with the modification of dwell times on the surface obturator needles relative to a central obturator needle. DVH evaluation was done on each plan to compare dosimetric parameters.
Results: The V150% dose was much larger in patient case than the phantom case due to the non-parallel needles. The modification of dwell times for the vaginal surface needles significantly reduced the volume of vagina wall receiving the V150% dose from 77.6% to 57.8% and V175% dose from 57.5% to 20.2% in patient case. Figure shows dose profiles from the vaginal surface of the obturator to the entire target volume between the needles (lowest dose area) in the phantom case. Modification of using 0% obturator surface needles after geometric optimization (plan 3) and no dwell position for inner obturator surface needles at the time of geometric optimization (plan 4) have lowest vaginal wall dose without changing target volume coverage.
Conclusions: To reduce high dose volume of the vaginal wall, we now routinely insert a needle into the central canal of the vaginal obturator and modify dwell times at the needles along the surface of vaginal obturator to reduce the volume of the vaginal wall from exceeding 150% prescription dose.



PO-1028

Preliminary dosimetric results of MR-based IGABT for cervical cancer in comparison to standard plan

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Purpose/Objective: Brachytherapy is the cornerstone of radiotherapy treatment in cervical cancer. In the last decade an increasing number of publications based on single institution large series indicate MR based IGABT as the new gold standard of treatment allowing a dramatic decrease of morbidity and at the same time an increase in local control especially for large tumors. Hereby we describe preliminary dosimetric results of MR IGABT at our institution.

Materials and Methods: Since December 2012, 71 consecutive patients (median age 50,5; range 31- 88,5) with a histologically proven diagnosis of locally advanced cervical cancer have been referred to GYN tumor board at our Institution.

FIGO stage distribution was the following: 5 had Ib1, 4 had Ib2, 1 had IIA, 28 had IIB with mid proximal parametrial invasion, 12 had IIB with distal parametrial invasion, 1 had IIIA, 13 had IIIB (11 because pelvic wall invasion), 7 had IVA cancers. All cases were Diagnostic routine for all patients consisted in thorax and abdomen CT and pelvic MR. PET CT was obtained in selected cases. All patients had laparoscopic retroperitoneal lymphadenectomy. All patients received radio-chemotherapy consisting 3DCRT (45 Gy in 25 fr.) concomitant to chemotherapy (weekly cisplatin 40 mg m2) followed by 4 fraction of 7 Gy each within two different BT insertions. Median overall treatment time was 43 days. 2-3 days before 1 BT implant all patients had a T2 MR scan to define tumor regression during radio-chemotherapy. All BT applications were performed under spinal anesthesia with TRUS and trans-abdominal US guidance. We used MR compatible Tandem Ovoids applicators (Elekta Utercht type) or Tandem Ring applicator (Elekta Vienna type) with either plastic or titanium needles if needed. At first application all patients had an MR with the applicator in place and a i.v. contrasted CT. A direct reconstruction approach based on applicator library or template was used to reconstruct applicators on MR images. Target volumes and OAR were contoured on MR according GEC ESTRO reccomendations. In all cases we started the planning process with a standard point A plan which was subsequently modified in order to reach our planning aims that are the following: HRCTV D9086Gy EQD2, Bladder D2cc<90 Gy EQD2, Rectum and Sigmoid bowel D2cc<70 GyEQD2. In the present study we report DVH comparison between Standard and optimized plans.

Results: Preliminary dosimetric results are summarized in fig. 1. At the present moment we had 2 patients with persistent disease after BT. Both cases were large IIIB tumors with infiltrative growth pattern and received a D90 dose of 85,21 and 85,51 Gy EQD2 respectively. No intraoperative or perioperative events have been registered so far.

Conclusions: In our preliminary experience MR based IGABT is strikingly superior to standard treatment.

PO-1029

Intra-fractional organ position variation evaluation during HDR intracavitary brachytherapy of cervical cancer

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Purpose/Objective: Image-Guided brachytherapy (IGBT) is related to treatment based on the 3D imaging for the planning procedure, not for the evaluation of the precision and accuracy of the treatment, which is the goal of the Image-Guided radiotherapy (IGRT). The aim of this study was assessment of probable intra-fractional organ displacement after the 3D imaging of the planning purpose.

Materials and Methods: Thirty intracavitary bracytherapy insertions (with Rotterdam's tandem and ovoid applicators) of cervical cancer patients were studied. A CT scanning were done for each of the cases, for treatment planning, after the applicator insertion. Treatment planning was based on getting 80-90 Gy total dose to D90 of the HR-CTV (EQD2) and 70Gy and 80Gy for rectum and bladder (D2cc), respectively. For each of those insertions a second CT scan were performed for the patients, just after the finishing of her treatment and before the applicators removed from her body. The scanning protocols (e.g. the amount of normal saline injection to the bladder Foley) were the same as the first CT imaging. Organ contouring and applicators reconstructions were performed with the same physician and physicist. The first 3D treatment planning were copied